

What Is Claimed Is:

- 1 1. A filter circuit, comprising:
2 a transconductance device for outputting a current signal
3 according to an input voltage and a feedback voltage;
4 a transresistance device coupled to the transconductance
5 device for outputting a output voltage according to
6 the current signal, wherein the transresistance
7 device comprises:
8 a first capacitor;
9 a resistor network coupled to the capacitor and
10 the transconductance device comprising a plurality
11 of stages connected serially, wherein each stage of
12 the resistor network comprises:
13 an input node;
14 an output node;
15 a first resistor coupled between the input
16 node and the ground; and
17 a second resistor coupled between the input
18 node and the output node;
19 wherein a time constant of the filter circuit is determined
20 by the first capacitor and the resistor network; and
21 a feedback device coupled between the transconductance
22 device and the transresistance device for outputting
23 the feedback voltage according to the output voltage.
- 1 2. The filter circuit as claimed in claim 1, wherein the
2 transconductance device comprises:
3 a first operational amplifier having a first
4 non-converting input terminal coupled to a ground,

5 a first converting input terminal and a first output
6 terminal to output the current signal;
7 a first resistor coupled to the first output terminal and
8 the first converting input terminal; and
9 a second resistor coupled to the first converting input
10 terminal for receiving the input voltage.

1 3. The filter circuit as claimed in claim 1, wherein the
2 transresistance device comprises:

3 a second operational amplifier having a second
4 non-converting input terminal coupled to a ground,
5 a second converting input terminal and a second
6 output terminal to output the output voltage;
7 the first capacitor coupled to the second output terminal
8 and the second converting input terminal; and
9 the resistor network coupled to the second converting input
10 terminal for receiving the current signal.

1 4. The filter circuit as claimed in claim 3, wherein the
2 resistance of the first resistor is two times larger than the
3 resistance of the second resistor.

1 5. The amplifier circuit as claimed in claim 4, wherein
2 the equivalent resistance of the resistor network is $2^n \times R$,
3 wherein the resistor network includes n stages and the
4 resistance of the second resistor is R.

1 6. The amplifier circuit as claimed in claim 3, wherein
2 each of the first resistor and the second resistor is implemented
3 by a MOS transistor.

1 7. The filter circuit as claimed in claim 1, wherein the
2 feedback device comprises:
3 a third operational amplifier having a third
4 non-converting input terminal coupled to a ground,
5 a third converting input terminal and a third output
6 terminal to output the output voltage;
7 a third resistor coupled to the third output terminal and
8 the third converting input terminal; and
9 a fourth resistor coupled to the third output terminal for
10 outputting the feedback voltage.